

Appl. No.: 10/796,752
Amdt. Dated: April 3, 2007
Reply to Office Action of: October 6, 2006

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of sealing, the method comprising:
providing a top glass substrate and a bottom glass substrate, and at least one layer of organic material between the substrates; and
focusing a relatively high power, short-duration laser irradiation onto a region of the top glass substrate, thereby sealing the top substrate to the bottom substrate.
2. (Canceled)
3. (Original) A method as recited in claim 1, wherein the focusing effects a localized non-linear optical absorption of the light.
4. (Original) A method as recited in claim 3, wherein the non-linear optical absorption is a multiphoton absorption.
5. (Currently Amended) A method [[of]] as recited in claim 2, wherein at least one of the substrates absorbs substantially none of the light from the laser wavelength at low intensities.
6. (Original) A method as recited in claim 1, wherein one of the substrates does not have electrodes.
7. (Original) A method as recited in claim 2, wherein a bandgap of the at least one glass substrates lies in the UV range.
8. (Original) A method as recited in claim 7, wherein the top glass substrate absorbs energy through non-radiative process.
9. (Original) A method as recited in claim 8, wherein the top glass substrate efficiently transfers energy from the laser to heat through non-radiative process.

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10. (Original) A method as recited in claim 1, wherein an OLED material is between the two glass substrates.

11. (Withdrawn) An apparatus for sealing, comprising:

a laser;

a controller, which controls the output power of the laser; and

an optical element that focuses light from the laser onto a top substrate, wherein the substrate absorbs the light in a multiphoton absorption process, providing a hermetic seal between the top substrate and a lower substrate.

12. (Withdrawn) An apparatus as recited in claim 11, wherein the laser emits light at a wavelength that corresponds to an energy that is less than a bandgap energy of a material of the top layer.

13. (Withdrawn) An apparatus as recited in claim 11, wherein the focusing of the light by the optical element provides an intensity within a focal volume of the optical element that exceeds a threshold for multiphoton absorption.

14. (Withdrawn) An apparatus as recited in claim 11, wherein the laser emits light at a wavelength that corresponds to an energy that is less than a bandgap energy of a material of the top layer.

[[14]] 15. (Withdrawn) An apparatus as recited in claim 11, further comprising:
a diagnostic system, which provides monitoring of a sealing process.

[[15]] 16. (Withdrawn) An apparatus as recited in claim 14, wherein the diagnostic system 206 provides distance feedback measurement information.

[[16]] 17. (Withdrawn) An apparatus as recited in claim 14, wherein the diagnostic system 206 provides laser energy data.

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[[17]] 18. (Withdrawn) An apparatus as recited in claim 14, further comprising an optical element that reflects light from the laser, and which transmits light from a probe beam from the diagnostic system.

[[18]] 19. (Withdrawn) An apparatus as recited in claim 17, wherein the probe beam is emitted from a light source of the diagnostic system.

[[19]] 20. (Withdrawn) An apparatus as recited in claim 11, wherein the bottom substrate and the top substrate are glass, and an OLED material is disposed over the bottom substrate.

[[20]] 21. (Withdrawn) An OLED package, comprising:

a top substrate and a bottom substrate; and a
a glass hermetic seal between the substrates, which provides a barrier to contaminants.

22. (New) A method of sealing a glass package comprising:

providing a top glass substrate and a bottom glass substrate, and at least one layer of organic material disposed between the top and bottom substrates;
focusing a laser on a region of the top substrate; and
wherein the top substrate is transparent to an emission wavelength of the laser, and the irradiated region of the top substrate is heated by nonlinear absorption to swell the region and form a hermetic seal between the substrates.

23. (New) The method as recited in claim 22, wherein a temperature of the at least one layer of organic material does not exceed 100°C during the heating.

24. (New) The method as recited in claim 22, wherein the laser is focused within an interior region of the top substrate a pre-determined distance from a surface of the substrate.

25. (New) The method as recited in claim 22, wherein a focal point of the laser is in an interior of the top substrate.

26. (New) The method as recited in claim 22, wherein the top substrate has a UV absorption edge this is at or below the two photon energy of the laser.

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27. (New) A method of sealing a glass package comprising:
providing a top glass substrate and a bottom glass substrate with at least one layer of organic material disposed therebetween;
focusing a laser on an interior region of the top substrate in a manner that causes nonlinear absorption in the top substrate, thereby locally heating and swelling the top substrate to form a hermetic seal between the first and second substrates.
28. (New) The method as recited in claim 28, wherein the non-linear absorption comprises a two or more photon process.
29. (New) The method as recited in claim 28, further comprising controlling a distance between a focal point of the laser and a surface of the top substrate to control the swelling.
30. (New) The method as recited in claim 28, wherein the hermetic seal is effective to prevent no more than about 10^{-3} cm³/m²/day of oxygen or no more than about 10⁻⁶ g/m²/day water to penetrate the seal.
31. (New) The method as recited in claim 28, wherein a temperature of the at least one layer of organic material does not exceed 100°C during the local heating.
32. (New) The method as recited in claim 28, wherein the laser is a nanosecond pulsed laser or a femtosecond pulsed laser.